1. [*In this question position vectors are given relative to a fixed origin O*]

At time t seconds, where $t \geq 0$, a particle, P, moves so that its velocity $\mathbf{v}$ m s^{-1} is given by

$$\mathbf{v} = 8t\mathbf{i} - 15t^{\frac{3}{2}}\mathbf{j}$$

When $t = 0$, the position vector of P is $(-5\mathbf{i} + 3\mathbf{j})$ m.

(*a*) Find the acceleration of P when $t = 9$.

(3)

(*b*) Find the position vector of P when $t = 4$.

(3)

(Total for Question 1 is 6 marks)